#### TESTING CORPORATION

FOUNDATION BOKINGS AND TOROPETE LOGITHMAN SE 555 505

June 9, 1983

Paxton Landfill Corporation 12201 South Oglesby Chicago, Illinois 60633

> Soil Investigation RE: Paxton Landfill Addition 116th. & Paxton Chicago, Illinois

#### Gentlemen:

Enclosed are copies of our boring logs for the subsurface investigation performed for the above referenced project.

Five soil borings were made for this investigation which were located in a previous landfill dump site situated east of the present active landfill site. As understood, the purpose of the borings was to determine the depth of the existing refuse material, then extend the borings into the natural soil to a minimum depth of 30 feet below the buried refuse using split spoon continuous sampling procedures to collect samples for laboratory testing. Also shelby tube samples were taken in each unconsolidated material type encountered.

The bore hole was advanced by means of hollow-stem augers. The existing trash material was occasionly sampled to verify if natural soil had been reached. Once contact had been made with the natural soil, split spoon samples and shelby tubes were taken. At this point the boring were stopped for fear that continuing the drilling may contaminate the underlying soils with the contaminated water in the trash material. Before retracting the entire string of augers, several feet was retracted then a bentonite slurry was pumped to the bottom of the bore hole in order to provide a seal in the penetrated natural soil. This procedure was followed in all the bore holes.

In boring no. 2G, after the depth of trash had been determined and augers retracted, the bore hole was located with offset stakes and distances recorded. A backhole then removed the existing trash to the level determined in the boring of about 17 feet, and then replaced it with clay fill soil to the original ground surface elevation that was taken earlier. The bore hole was relocated and the drill rig reset over the hole. Sampling was then begun at the next continuous sampling interval at the 21 to 22.5 foot level and continued toa depth of 80 feet. The bore hole was again sealed with a bentonite clay slurry mixture. This completed the subsurface investigation.

Respectfully submitted,

GROFF TESTING CORPORATION

STATE OF ILLINOIS

PHONE 815 / 939-1153

# GROFF

#### TESTING CORPORATION

SAMPLER TYPE

CA - CONTINUOUS FLIGHT AUGER

SS - DRIVEN SPLIT SPOON

ST - PRESSED SHELBY TUBE

RC -- ROCK CORE

Paxton Landfill Corporation Boring #\_ B-1G Andrews Environmental Engineering leb # Architect Engineer\_\_\_\_ Paxton Landfill Corp. Addition Drawn By R. Groff 116th. & Paxton, Chicago, Ill. DRILLING and SAMPLING INFORMATION 5-25-83 Hammer WI 140 TEST DATA NATURAL DRY DENSITY LBS SQ FT Date Completed 5-25-83 30 \_ Hammer Drop \_ 100 Drill Foreman R. Groff Spoon Sampler O.D. 2 O UNCONFINED COMPRESSIVE STRENGTH TONS FT? Inspector A. Rathsack Rock Core Dio Boring Method \_\_HSA \_ Shelby Tube C.D \_\_ LIQUID LIMIT ". WATER CONTENT % X PLASTIC LIMIT % 10 20 40 50 SOIL CLASSIFICATION STANDARD PENETRATION BLOWS FT SURFACE ELEVATION- 14.12 Hard gray SILTY CLAY. 100 2.0 (FILL) Misc. TRASH. 10. 15 7 2 SS 20 25 30 39.040 4 55 Dense gray non-plastic very moist SILT, tr.clay(ML) 43.0 Gray low plastic SILTY CLAY 45 lit-some sand, tr.gr. (CL) 5 ST 47.0 End of Boring at 47.0' 50

GROUND WATER DEPTH

₩ AFTER \_\_\_\_\_\_ HRS. \_\_\_\_\_ FT.

WATER ON RODS \_\_\_\_\_FT

 $\nabla$  AT COMPLETION 7.41 FT. (6.71)

BORING METHOD

HSA-HOLLOW STEM AUGERS
CFA-CONTINUOUS FLIGHT AUGERS

DC-DRIVING CASING

MD-MUD DRILLING

HSA-HOLLOW STEM AUGERS CFA-CONTINUOUS FLIGHT AUGERS

DC-DRIVING CASING

MD-MUD DRILLING

### TESTING CORPORATION

ST - PRESSED SHELBY TUBE

RC -- ROCK CORE

CA - CONTINUOUS FLIGHT AUGER

Owner Paxton Landfill C	orpor	atio	n		_	_	Soring #	1	B-2G			<del></del>	
Architect Engineer Andrews Environme	ntal	Engi	nee	rin	g		Job #		1685				
Project Nome Paxton Landfill C	orp.	Addi	tio	n		_	Drawn By	1	R. Gr	off			
Project location 116th. & Paxton,	Chica	go,	111	•			Approved	Ву1	RG		·		
DRILLING_and_SAMPLING INFOR	MAŢIQN							,	TEST	DATA			
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Drill Foreman R. Groff Spoon Sampler			in				O UNC	ONFINED	COMPRES	SIVE STREN	GTH TON	S FT:	]
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-	1	35_	8	SS				8	00				$\pm$
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plastic SILTY CLAY.	42	\$.	11	SS				-	8	1			干
trace sand. (CL)	<b>F</b>  43.	45_	12	ST	17	•		<b>—</b>			<b></b>		#
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Gr.mst. low pl. SILTY CIA	48.	150_	14	SS						74/1	2 -		中
Dense gr.f-m SAND dry			15	SS						80/1			#
See page 2		55	16		i :					90/1	-		本
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SAMPLER TYPE		GROUN				_	Ele			RING MET			
SS - DRIVEN SPLIT SPOON	T AT CO	MPLETIO	~		<u> </u>	_ F	1, 3 7 . 4	<del>√</del> / H	DA-HOLLC	OW STEM A	.OOE #2		

₩ AFTER \_\_\_\_\_\_ HRS. \_\_\_\_\_ FT.

WATER ON RODS \_\_\_\_\_FT

CFA-CONTINUOUS FLIGHT AUGERS

HSA-HOLLOW STEM AUGERS

DC -DRIVING CASING

MD MUD DRILLING



## TESTING CORPORATION

SS - DRIVEN SPLIT SPOON

ST - PRESSED SHELBY TUBE

RC -- ROCK CORE

CA -- CONTINUOUS FLIGHT AUGER

Owner Paxton Landfill Con	rpor	atio	n				Boring #	1	B-2G			
Architect Engineer Andrews Environment							Job #	•	1685			
Project Name Paxton Landfill Con						_	Drawn By	1	R. Gro	ff		
Project Location 116th. & Paxton, Ch							Approved	Ву	RG			
Date Started S-25-83 Hammer WI										DATA		
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Date Completed 5-27-83 Hammer Drop			ın				9	0	100	110 11	20 1	30
Drill Foreman R. Groff Spoon Sampler O			10				O UNO	ONFINE	D COMPLES	SIVE STREM	GIH TON	5 41
Inspector A. Rathsack Rock Core Dio	~		in			æ		<u> </u>	?	3		<u> </u>
Boring Method HSA Shelby Tube O.D.			'n	TYPE	ERY	WAT	● WA	TER CON	ITENT %		LIQUID L	
SOIL CLASSIFICATION	¥				RECOVERY	9	1	0	70			0
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Very hard gray med-plastic		:	19	SS						DA/ T		
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V.hard gr. med.pl. SILTY		-								1	<del></del>	
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- V.dse. gr.low-pl. moist	73.	1 -	23	SS				•		80/1	9 11	
Clay SILT, tr.sd. (ML)	1′3•	75 -	24	SS					1	57/1	2 #4	
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SAMPLER TYPE	(	GROUND	WATE	R DE	PTH		Ele	v.	80	ORING METI	10D	

17 AT COMPLETION 2.40 FT (9.24)

₩ AFTER \_\_\_\_\_\_ HRS \_\_\_\_\_\_ FT.

WATER ON RODS \_\_\_\_\_FT

## GROFF

## TESTING CORPORATION

Owner Paxton Landfill Co	orpo	rati	<u>on</u>				Boring # .		-3G			
Architect Engineer Andrews Environmen	ntal	Eng	ine	eri	ng		Job #	1	685			
Project Name Paxton Landfill Co	orp.	Add	<u>it</u> i	on			Drawn By .	R	. Gro	f <b>f</b>		
Project Location 116th. & Paxton,	Chic	ago,	<u>_I</u> 1	1.			Approved	ay R	G			
DRILLING and SAMPLING INFORMA	MOLTA						··		TEST	DATA		
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Boring Method 13A Shelby Tube C.D.			10	14 P.E	COVERY	WATER	_	ER CONTE		×	LIQUID LI PLASTIC L	UMIT %
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SAMPLER TYPE

SS - DRIVEN SPLIT SPOON ST - PRESSED SHELBY TUBE

CA -- CONTINUOUS FLIGHT AUGER

RC -- ROCK CORE

GROUND WATER DEPTH Elev.

77 AT COMPLETION 3.31 FT (9.59)

WATER ON RODS \_\_\_\_\_\_FT

Elev. BORING METHOD

HSA - HOLLOW STEM AUGERS

CFA-CONTINUOUS FLIGHT AUGERS

DC - DRIVING CASING

MD MUD DRILLING

#### TESTING CORPORATION

Owner Paxton Landfill Con	rpor	atio	n_				Boring #		B-4G	<del></del>			
Architect Engineer Andrews Environmen	tal	Enqi	nee	rir	ig		Job #		1685				
Project Name Paxton Landfill Co.	rp.	Addi	<u>ti</u> o	n			Drawn By		R. Gr	off			
Propert location 116th. & Paxton, Cl	hica	go,	Ill	•			Approved		RG				
DRILLING and SAMPLING INFORMATION STORED STO	MQIJ4								TEST	DATA			
Date Started 5-26-83 Hammer Wt	140		lbv				NAT	URAL DRY	DENSITY	LBS SQ F	T		l
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Drill Foreman R. Groff Spoon Sampler O			in		3	1	O UNC	ONFINED	COMPRESS	IVE STREN	GTH TONS	FT -	
Inspector A. Rathsack Rock Core Dia			ın	1		~	1		2	3	. 5		1
Boring Method HSA Shelby Tube C.D.	3		10	TYPE	ERY	WATER	● WAT	ER CONTI	ENT %		LIQUID LI PLASTIC L		
SOIL CLASSIFICATION	Ę		L.	<u> </u>	COVE		10	0 2	0 3	0 4			
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Blk & br. Clay/Cinders(FILL	2.5	-	1	SS		H		8					F
- Misc. TRASH	12.5	-	<del>                                     </del>		1	^						·	F
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SAMPLER TYPE 55 - DRIVEN SPLIT SPOON

ST - PRESSED SHELBY TUBE

CA -- CONTINUOUS FLIGHT AUGER RC -- ROCK CORE

GROUND WATER DEPTH Elev.
TO AT COMPLETION 3.00 FT. (8.29)

₩ AFTER \_\_\_\_\_ HRS \_\_\_\_\_ FT WATER ON RODS \_\_\_\_\_FT

BORING METHOD

HSA-HOLLOW STEM AUGERS CFA-CONTINUOUS FLIGHT AUGERS

DC - DRIVING CASING

MD MUD DRILLING

### TESTING CORPORATION

RC -- ROCK CORE

CA -- CONTINUOUS FLIGHT AUGER

Paxton Landfill						_	Boring #		-5G				
rchitect Engineer Andrews Environm							Job =		585				
Olect Name Paxton Landfill						_	Drawn By	R	Grof	<u>f</u>			
oper location 116th. & Paxton,	Chica	ago,	11	L .			Approved	RO RO	3	<del></del>			
DRILLING and SAMPLING INFOR	MATION							, —	TEST	DATA			
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ring Method HSA Shelby Tube C	. p	3	·n		RY	ATER	<b>■</b> ₩4:	TER CON	<del></del>	<del></del>	LIQUID L	IMI!	1
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SOIL CLASSIFICATION	STRATUM	I 4	12	PLE	ECC	GROUND	<b></b>	<del></del>	PENETRATIO	+	OWS FT	<del></del>	1
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Hard to stiff gray		-		SS				<b>68</b> 0		<del>                                     </del>	10		+
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Gray non-plastic, very	<b>∐47.</b>	\$ =	}	1					$\pm -$		$\pm =$		$\pm$
moist-wet SILT, lit.	50	50_	10	00	1	1		<del>[                                    </del>	9 8	<u> </u>			7
sand, tr. clay (ML)	当ši.		İΪ	37	12	1		<b>!</b>	- YO	1			#
End of Boring at 51.5'	51:	T ~	1		1			<u> </u>		<u> </u>			士
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CAMBIER TVE		GROUND	WAT-				Ele	v.		RING MI	THOR		
SAMPLER TYPE SS — DRIVEN SPLIT SPOON	T7 AT COA					g	ı (15.	-	BC HSA – HOLLO				
ST - PRESSED SHELBY TUBE	AT COR		•		-	_ '		,			FLIGHT AUC	ERS	

W AFTER \_\_\_\_\_\_ HRS \_\_\_\_\_

WATER ON RODS \_\_\_\_\_FT

\_\_\_ FT.

DC -DRIVING CASING

MD MUD DRILLING

# SHAFFER-KRIMMEL-SILVER & ASSOCIATES, INC. CONSULTING ENGINEERS

2900 N. Broadway • P.O. Box 2233 • Decatur, Illinois, 62526 • 217/877-2100

June 9, 1983

HAROLD S. SHAFFER, PE-SE ROBERT G. KRIMMEL, PE-LS VAN A. SILVER, PE

SKS #21962

Mr. Andrew Rathsack Andrews Environmental Engineering 1320 South Fifth Street Springfield, Illinois 62703

Re: Laboratory Testing
Paxton Landfill

Dear Mr. Rathsack:

Enclosed are three (3) copies of our report presenting the results of our laboratory tests, conducted on the recently received Shelby-tube samples, from the Paxton Landfill. The cation-exchange capacity results are shown on our tabulation sheet which accompanies the report.

We had some difficulty determining the permeability of the ML soil from Boring 4, Sample 5. We ran an additional sample to confirm the data obtained from the 1st sample. The permeability of this soil will obviously depend on the presence, or lack of silt seams and/or lenses present in the sample tested. The value reported was the average of the 2 samples tested.

One (1) copy of the report is being sent to Groff Testing Corporation as you requested. If there are any questions do not hesitate to contact us.

Very truly yours,

SHAFFER, KRIMMEL, SILVER & ASSOCIATES, INC.

BY:

William Coberly,

Associate

JWC/sal

Enclosures

Copy to: Groff Testing Corporation

CIVIL ENGINEERS

GEOTECHNICAL ENGINEERS

LAND SURVEYORS

JUN 12 1984

E.P.A. - D.L.P.G. STATE OF ILLINOIS

CIVIL ENGINEERS GEOTECHNICAL ENGINEERS STRUCTURAL ENGINEERS LAND SURVEYORS CONSTRUCTION QUALITY CONTROL MATERIALS TESTING

2900 N. Broadway • P.O. Box 2233 • Decatur, Illinois, 62526 • 217/877-2100

PROJECT: Paxton Landfill

Chicago Area, Illinois

CLIENT: Andrews Environmental

Engineering, Inc.

DATE: June 9, 1983

PROJECT NO. 18-21962-6S

REPORT NO. 21962-9

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LABORATORY TESTING PAXTON LANDFILL CHICAGO, ILLINOIS

E.P.A. - D.L.P.C. STATE OF ILLINOIS

On May 31, 1983, six (6) thin-walled tube samples (Shelby Tubes) were delivered to our Decatur laboratory by a representative of Andrews Environmental Engineering. The 3" O.D. Shelby Tubes were obtained from various soil borings made at the Paxton Landfill, Chicago, Illinois. They were identified by boring number, sample number, and sampling depth.

We were instructed to perform the following tests on portions of the soil extruded from each shelby tube. Those tests were: permeability (hydraulic conductivity), Atterberg limits, as received moisture content, grain-size analysis, and Ion-exchange Capacity. The Ion-exchange capacity was to be conducted by: Teklab; Collinsville, Illinois.

The samples were extruded from the Shelby Tubes and the contents visually examined and classified. The classification was conducted in accordance with ASTM D 2487, Unified Soil Classification System. Some of the samples contained more than one type of soil. After consultation with Andrews Environmental Engineering, Inc. the soil type was selected upon which the tests would be conducted.

A portion of each soil type to be tested was prepared for each specific test. The soil was dried and reduced/pulverized such that it would pass the No. 40 sieve. Approximately 200g., of each sample, was sealed in jars and shipped to Teklab for determination of the

Cation-Exchange Capacity.

The permeability (hydraulic conductivity) was determined from a portion of the sample, which was mechanically reduced to a size suitable for the test. The permeability was measured using a 20 psi confining pressure and a 15 psi constant head pressure. The samples were orientated such that the flow was from top to bottom, as sampled in the field.

The test results are presented on the attached sheets titled, "Soil Classification and Engineering Properties", Sheets 1 & 2. The sample descriptions and classification are presented below.

S	PLE

Boring No.	Sample No.	Dep <b>th</b> (ft.)	DESCRIPTION	USCS CLASSIFICATION
1	5	45'-47' (19" Re- covered)	Gray, moist, low plasticity silty clay, some sand, trace of gravel	CL
2	7	31'-33' (23" Re- covered)	Gray, moist, medium plasticity silty clay, trace of sand, occ. silt lenses	CL
2	12	42.5'-44.5' (17" Re- covered)	Top 6"-Gray, very moist to wet, medium plasti- city silty clay, trace of sand	. CL
- Tes	ted Top 6	" <u>_</u>	Mid 8"-Gray, moist, low plasticity clayey silt, occ. silt seam, trace of sand	
			Bot. 3"-Gray, moist, loplasticity silty clay, little sand, trace of gravel	ow CL
2	20	63.5'-65.5' (20" Re- covered)	Gray, moist, medium plasticity silty clay, trace of sand, occ. silt lenses	CL
4	5	40'-41' (11" Re- covered)	Top 8"-Gray, very moist to wet, non plastic silt, trace of sand	. ML
- Tes	ted Top 8	n _	Bot. 3"-Gray, wet, mediplasticity silty clay, trace of sand & gravel	um RECEIVED
			crace or band a graver	JUN 13 19841

E.P.A. — D.L.P.G. STATE OF HEINDIG SAMPLE

Boring S	Sample No.	Depth (ft.)	DESCRIPTION	USCS CLASSIFICATION
5	11	50'-51.2' (12" Re- covered)	Top 8"-Trash and some silty clay	
-Tested	Bottom	4"-	Bot. 4"-Gray, very moist to wet, non plastic silt little sand, trace of clay	

All testing, except as described for permeability determinations, was conducted in accordance with the applicable ASTM standard. A chart depicting the Unified Soil Classification System is attached at the end of the report.

SHAFFER, KRIMMEL, SILVER & ASSOCIATES, INC.

BY:

J. William Cobe

Associate

JWC/sal

RECEIVED

JUN 13 1984

E.P.A. — D.L.P.G. STATE OF ILLINGIS

# SHAFFER-KRIMMEL-SILVER A ASSOCIATES INC. CONSULTING ENGINEERS

SOIL CLASSIFICATION AND ENGINEERING PROPERTIES

2900 N. Broadway + P.O. Box 2233 + Decatur, Hillinois, \$2526 + 217/877 2100

OPT. MOISTURE CONTENT; %

meq./100g.

& ASSOCIATES

CATION-EXCHANGE

PERMEABILITY, cm/sec

CAPACITY

PROJECT:

Paxton Landfill

Chicago, Illinois

JOB NO. 18-21962-6S

Chicago, i			:	DATE: Jun	e 9, 1983	
CLIENT: Andrews Envi		ental Eng.	Theering	<del> </del>	·	Sheet 1
BORING/SAMPLE NO'S.		1/5	2/7	2/12	2/20	4/5
DEPTH/ELFVATION		45'-47'	31'-33'	42.5'-44.5'	63.5'-65.5'	40'-41'
SOIL PARTICLE SIZES				·		· · · · · · · · · · · · · · · · · · ·
GRAVEL;	- 8	3		2	3	
SAND;	ક	30	8	7	7	11
coarse	<u>&amp; </u>	2	1		1	
medium	8_	13	3	2	2	
fine	á	15	4	5	4	1
FINES;	Q.	67	92	91	90	99
silt	9,	48	49	45	54	94
clay (0.002 mm)	8	19	43	46	36	5
PLASTICITY CHARACTERI	STIC	S				
MOISTURE CONTENT	ę,	14	22	29	16	24
LIQUID LIMIT		27	40	40	35	
PLASTIC LIMIT		17	19	18	17	
PLASTICITY INDEX		10	21	22	18	Non- plastic
CLASSIFICATION						
USCS		CL1	CLm	CLm	CL <sub>m</sub>	ML
USDA AASHTO						O Same of Same last
ENGINEERING PROPERTIE	S				i i Spane V	ست حضا لا فاحدث فرر
MAX. DRY DENSITY; pcf					JUI	रेच ।तवस।
		† · · · · · · · · · · · · · · · · · · ·	1	1	5 3 A	

22.8

1.3 x 10<sup>-9</sup>

20.3

 $1.7 \times 10^{-8}$ 

14.8

 $2.4 \times 10^{-8}$ 

CONSULTING ENGINEERS



SOIL CLASSIFICATION AND ENGINEERING PROPERTIES

2900 N. Broadway + P.O. Box 2233 + Decatur, Illinois, \$2526 + 217/877-2100

PROJECT:

Paxton Landfill

& ASSOCIATES

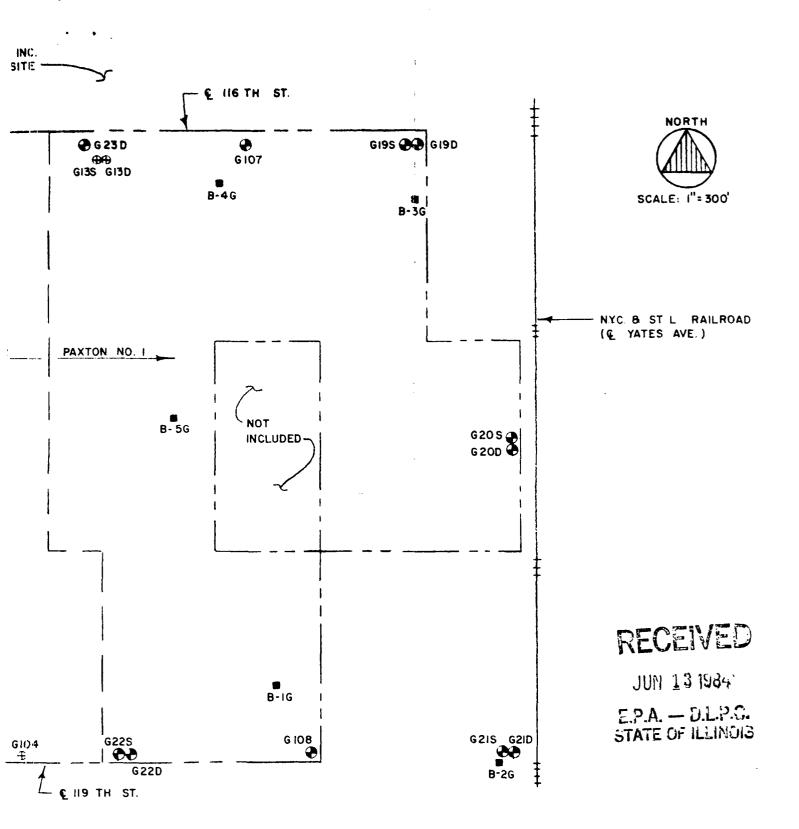
Chicago, Illinois

JOB NO. 18-21962-6S

DATE: June 9, 1983 CLIENT: Andrews Environmental Engineering Sheet 2 BORING/SAMPLE NO'S. 5/11 50'-51.2' DEPTH/ELFVATION SOIL PARTICLE SIZES GRAVEL; 10 SAND; 2 coarse 4 medium 4 fine 90 FINES; કૂ 81 silt <u>clay</u> (0.002 mm) PLASTICITY CHARACTERISTICS 21 MOISTURE CONTENT ક્ર LIQUID LIMIT PLASTIC LIMIT Nonplastic PLASTICITY INDEX CLASSIFICATION USCS ML USDA/AASHTO ENGINEERING PROPERTIES NEULIVED MAX. DRY DENSITY; pcf JUN 13 19841 OPT. MOISTURE CONTENT; % CATION-EXCHANGE E.P.A. + D.L.P.G. CAPACITY meq./100g. 9.7 STATE OF ILLINUIS  $3.6 \times 10^{-7}$ PERMEABILITY, cm/sec

CONSULTING ENGINEERS

SN	М	ore tha			AINED SOILS	200 si	eve		505	FINI or more		NED SOI		ve	Soils
MAJOR DIVISIONS	50 <b>\$</b>	GRAVELS or mor se frac on No.	e of	·ve		SANDS than 50 se frac No. 4	tion		Lic	S AND CL	it	Liq	AND CI uid lir er thar	n1t	Organic
\$	CLEAN GRAVEL	S	GRAVE WIT FINE	H	CLEAN SANDS			NDS ITH NES							Highly
GROUP SYMBOLS	GM	GP	GM	GC	SW	SP	SM	sc	ML	CL	OL	MH	СН	он	PT
TENET	Well-graded pravels and pravel-sand mixtures, little or no fires	Poorly graded gravels and pravel-sand mixtures, little or no fines	Silty gravels, gravel-sand-silt mixtures	Clayey gravels, gravel-sand-clay mixtures	Well-graded sands and gravelly sands, little or no fines	Poorly graded sands and gravelly sands, little or no fines	Silty sands, sand-silt mixtures	Clayey sands, sand-clay mixtures	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	Organic silts and organic slity clays of low plasticity	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts	Inorganic clays of high clasticity, fat clays	Organic clays of medium to high plasticity	Peat, muck and other highly organic soils
	Less than	5% Pas 12% Pa	Atterberg limits plotting Atterberg limits plot below N. O. 1 in hatched area are or plasticity index less that be borderline classifications	soo si symbols	sieve GM.	Not meeting both criteria for SW SW SW	fines , SP , SC	requiring controls	60 PLASTICITY CHART	For classificati So grained soils an tion of coarse-g		OE CO		(10 <u>+ (1) + (0)</u>	0 IO 20 30 40 50 60 70 80 90 150 EIQUID LIMIT



PAXTON LANDFILL AS SHOWN ON THE DRAWINGS FOR THIS SITE PREPARED V. GREENGARD ASSOCIATES, INC., HIGHLAND

PAXTON LANDFILL CORPORATION CHICAGO, ILLINOIS

ANDREWS ENVIRONMENTAL ENGINEERING, INC. SPRINGFIELD, ILLINOIS

LOCATION MAP

JUNE , 1984

